Sharing

Lea is a cookie enthusiast. She loves every flavour, form and variety of cookies, and has quite a few at home. Every time her nephew Tom visits her, he wants to eat as many cookies as possible. Because Lea does not want him to eat all of her cookies, she has invented a game to decide which cookies Tom gets.

She arranges the cookies in different bowls, in a long line. Each bowl may contain an arbitrary amount of cookies. She then chooses two bowls, say a and b (1-based), where a is to the left of or equal to b. Tom may then choose to either eat all cookies in bowls 1 to $a-1$, or all cookies in bowls a to b , or all cookies in bowls $b+1$ to n where n is the number of bowls.

Today Tom will visit again and she has already made the arrangement of the bowls and cookies. She only has to decide on the points a and b. Of course she wants to keep as many cookies as possible for herself. With the optimal choice, and assuming Tom will choose the part with the most cookies for himself, how many cookies can she keep?

Input

The first line of the input contains an integer t. t test cases follow.

Each test case consists of a single line containing 5 integers $n\ p\ q\ r\ s$ describing the bowls filled with cookies. There are n bowls and the i-th of them (1-based) contains $((i \cdot p + q) \mod r) + s$ cookies. Note that this format was chosen to keep the input small, it is not necessary to somehow exploit this formula.

Output

For each test case, print a line containing "Case #i: x" where i is its number, starting at 1, and x is the maximal number of cookies that Lea can keep for herself. Each line of the output should end with a line break.

Constraints

- $1 \leq t \leq 50$
- $1 \leq n \leq 10^6$
- $1 \leq p, q, r, s \leq 10^6$

Sample Case Explanation

In the first case there is only one bowl with one cookie in it, no matter which a and b Lea chooses Tom will pick the range with the cookie.

In the second case there are three bowls with $2, 1$ and 3 cookies. Lea chooses $a = b = 2$, Tom chooses bowl 1 and Lea keeps three cookies.

In the third case, there are 10 bowls with $9, 12, 4, 7, 10, 2, 5, 8, 11, 3$ cookies. Lea chooses $a = 4$, $b = 7$. The three parts contain $25, 24$ and 22 cookies. 25 for Tom, Lea keeps 46 for herself.

Sample Input 1	Sample Output 1
4 1 1 1 1 1 3 2 2 3 1 10 3 4 11 2 999999 999997 999995 1000000 999999	Case #1: 0 Case #2: 3 Case #3: 46 Case #4: 999997333337

Sample Input 2	Sample Output 2
20 4 4 3 3 4 3 5 7 8 4 2 6 8 3 5 6 8 5 8 2 8 8 3 5 8 3 7 7 7 3 6 2 2 2 6 4 8 7 3 2 6 7 7 6 4 3 5 5 5 6 6 4 6 3 2 8 3 3 6 2 8 5 4 4 7 7 5 4 2 6 8 2 2 7 2 3 6 5 3 5 5 7 3 8 2 5 6 4 3 4 7 5 6 8 8 6 6 3 7 2	Case #1: 11 Case #2: 13 Case #3: 7 Case #4: 28 Case #5: 50 Case #6: 6 Case #7: 24 Case #8: 6 Case #9: 22 Case #10: 12 Case #11: 11 Case #12: 16 Case #13: 42 Case #14: 26 Case #15: 26 Case #16: 14 Case #17: 17 Case #18: 15 Case #19: 46 Case #20: 17